REMARKS

Claims 18-27 remain pending in this application. Each of the pending claims is believed to defined an invention which is novel and unobvious over the cited references. Favorable reconsideration of this case is respectfully requested.

The present invention is related to isolation transformers that suppress high frequency electromagnetic noise. For example, reading claim 18 on the embodiment of the invention depicted in Figure 1, the isolation transformer comprises a multi-layer, multi-winding primary coil 1, fabricated by stacking coil layers 11-15 formed by winding an isolated, covered cooper wire and a multi-layer, multi-winding secondary coil 2 fabricated by stacking coil layers 21-25 formed by winding an isolated, covered copper wire. A core forms a magnetic path between the primarily coil 1 and secondary coil 2. A plurality of short-circuit rings 4, made of conducting thin films are sandwiched between the coil layers 11-15 and 21-25 of at least one of the primary and secondary coils 1, 2.

This structure provides an isolation transformer with high noise attenuation rates, as well as high reliability by sufficiently suppressing the amplitude of noise attenuation characteristic curves. Please see the present specification for this and other advantages of the present invention.

Claims 18-27 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,484,171 to McLoughlin in view of U.S. Patent No. 4,926,111 to Lungu. The cited references do not render the present invention obvious as they do not

teach or suggest, among other things, short circuit rings sandwiched between the coil layers of at least one of the primary coil and the secondary coil.

McLoughlin discloses an isolation transformer 22 comprising a primary winding 24, a secondary winding 26, and a metallic shield 28, column 4, lines 20-24. The metallic shield 28 is placed between the primary winding 24 and the secondary winding 26. The metallic shield 28 intercepts any possible electrostatic field line between any point on the primary winding 24 and any point on the secondary winding 26, column 5, lines 40-48. The isolation transformer places a metallic shield between a primary and secondary winding of the transformer and ground the shield. Common mode interference current then flows through the primary winding to shield capacitance to ground, providing isolation for the secondary winding and its load from the common mode interference on the primary winding, column 1, lines 39-45. Accordingly, it is clear that the metallic shield 28 described in McLoughlin forms a connection between the primary winding 24 and the second winding 26 (see figures 5-6), and is not sandwich between the coil layers of at least one of the primary coil and the secondary coil, as recited in the present claims.

Moreover, the metallic shield 28 of McLoughlin is not a short circuit ring. The metallic shield 28 comprises two overlapping members insulated from each other so as to not create a "shorted turn" around a portion of the core, column 6, lines 1-3. Figure 11 of McLoughlin illustrates a conventional L shaped member 76 composing the metallic shield 28, column 6, lines 13-14. Figure 12 shows an alternative implementation using

two U-shaped members 82 comprising the metallic shield 28, column 6, lines 19-21. Accordingly, McLoughlin teaches that the metallic shield 28 is not a conductive short circuit means as recited in the present claims, but is a non-shorted turns means.

Lungu does not supplement McLoughlin to teach or suggest the features recited in the present claims. Lungu describes an electric component with inductive and capacitive properties. A wire includes a core conductor 1 carrying a uniform and continuous concentric insulation layer 2, column 3, lines 22-25. A uniform metalization layer being as thin as possible, preferably a thin film, is deposited on the dielectric insulation 2 as external conductor 3, column 3, lines 31-34. The conductivity of the coil conductor 1 is much higher than the conductivity of the external conductor of the metalization 3, respectively, column 3, lines 37-39. It is the purpose of such construction to reduce short circuited turn effects to a minimum in view of the fact that due to a conventional winding process the external metalization 3 of adjacent turns and winding layers touching one another represent closed short circuited turns, column 3, lines 40-45.

The same winding potential U_w is created in the metalization 3 being electrically closed to form a circuit of the winding wire. This also may lead to disadvantageous short circuit currents, column 4, lines 30-33. The short circuit currents may be kept low by the metalization 3 applied in a thin layer, so that the effect thereof may be neglected. In the case of higher frequencies, the metalization 3 should be interrupted at a cross-section I of the coil 4, thus canceling the short circuit effect. To achieve this, the metalization is locally removed by electric discharging, column 4, lines 40-42. Accordingly, the thin

film deposited on the dielectric insulation 2 as an external conductor 3 in Lungu is taught to prevent the short circuit winding effect. In comparison, independent claim 18 recites that the isolation transform includes short circuit rings. Independent claim 27 recites that at least one short circuit ring is formed by coating a cooper wire.

As Lungu describes a wire which is used to cancel a short circuit effect, it teaches away from the present claims. Please see In re Haruna, 249 F.3d 1327, 58 USPQ2d 1517 (Fed. Cir. 2001), "A prima facie case of obviousness can be rebutted if the applicant . . . can show 'that the art in any material respect taught away' from the claimed invention," In re Geisler 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997) (quoting In re Malagari, 499 F.2d 1297, 1303, 182 (USPQ 549, 553 (CCPA 1974). 'A reference may be said to teach away when a person of ordinary skill, upon reading the reference, . . . would be led in a direction divergent from the path that was taken by the applicant.' Tec Air, Inc. v. Denso Mfe. Mich. Inc., 192 F.3d 1353, 1360, 52 USPQ2d 1294, 1298 (Fed. Cir. 1999)."

In view of the above discussion, it is clear that the cited references, taken alone or in combination do not teach or suggest the present invention. Therefore, the withdrawal of this rejection is respectfully requested.

If the Examiner is of the opinion that the prosecution of this application would be advanced by a personal interview, the Examiner is invited to telephone undersigned counsel to arrange for such an interview.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

The Commissioner is authorized to charge any fee necessitated by this Amendment to our Deposit Account No. 22-0261.

Respectfully submitted,

Date: 11/25/02

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VERSION SHOWING CHANGES MADE

IN THE DISCLOSURE:

Please replace third paragraph beginning on page 1, continuing on page 2 with the following rewritten paragraph:

For suppression of noise-related troubles isolation transformers of electromagnetic-shield type have been used. The isolation transformers of electromagnetic-shield type have primary- and secondary coils isolated by approximately 20 μm-thick aluminum foils. The isolation transformers of electromagnetic-shield type have such attenuation characteristics of normal-mode noise as depicted in Figure ~~9~~ 11. Namely, in the frequency range of several hundred Hz to 1 *MHz* the attenuation increases generally mildly with the frequency to -50*dB*. In the range from 1*MHz* to 100*MHz* it takes the form of an irregular saw-tooth wave, which is comprised by troughs and crests of various sizes between the maximum of -78*dB* and the minimum of -24*dB*.

Please replace first paragraph beginning on page 16, with the following rewritten paragraph:

Moreover, in the existing isolation transformers shown in Figure 4~~9~~, in which a single short-circuit ring 4 is used, the distance from the short-circuit ring of conducting thin film to each coil layer is different, and therefore the effect due to conducting thin film of eliminating or excluding the troubles caused by high-frequency noise components does not reach all parts of a coil on the average. In contrast, in the isolation transformer of the first embodiment, in which a short-circuit ring 4 of conducting thin film is

positioned tightly adjacent to every coil layer, it is possible for the effect of eliminating or excluding the troubles caused by high-frequency noise components due to conducting thin film to reach all parts of a coil on the average.